

## Turnip moth (*Agrotis segetum*) traps

### **Purpose:**

To test if new kind of traps for turnip moth are easier and better to use than the normal traps which are used in Denmark.

### **Background:**

Two kinds of traps are tested against the normal Danish traps.

### TrapView:

Is trap houses with a camera inside, which pictures the sticky floorboard in the “house” once a day. The results can be seen by logging in on the homepage: [trapview.com](http://trapview.com). This should be an easier way to see if there are turnip moths in the trap, and therefor can get a quicker reporting and warning to the growers.



### UK traps:

In UK a special designed funnel trap is used for monitoring turnip moths and warning of attack of cutworms in root crops like carrots. The traps called funnel traps are designed, so they are easy to maintain and empty for moths compared to the house traps with sticky floorboards traditionally used in Denmark.



*UK trap*

### Danish traps:

The traps traditionally used in DK are a little bit sensitive to rain and uncomfortable when changing the sticky floorboards.



*Danish trap*

### **Trial plan:**

In two fields with root parsley in central Jutland the traps were set up with lures for turnip moths, UK-traps versus DK-traps in one field and TrapView versus DK-traps in another other fields. The traps were placed 50 to 70 meter apart and alternated in between each other – see the map. At Hald the traps were placed in a field with 6.5 ha root parsley, 6.5 ha parsnips and 20 ha beet root, seeded on the 29<sup>th</sup> of April, 29<sup>th</sup> of April and 29<sup>th</sup> of May respectively. At Nørbæk the traps were placed in a field with 13.5 ha root parsley, 13.5 ha parsnips and 25 ha carrots, seeded on the 24<sup>th</sup> of April, 23<sup>rd</sup> of April and 25<sup>th</sup> of May respectively. Norwich seeded on the 17<sup>th</sup> of April. The traps were set up just after emergence of the root parsley and taken down again on the 15<sup>th</sup> of July.

The 26<sup>th</sup> of June six TrapView from SEGES came in to the experiment as well, three traps were placed in Himmestrup between two fields with carrots and red beets. The other set (of three traps) was placed in a carrot field at Aalborgvej.

Traps were emptied and moths counted once a week. The root crops were all organic and not sprayed with insecticide. The soil type is light sand with the possibility of irrigation. There have been carrots, root parsley and parsnips in the fields around the test field for the last five years. A rain gauge was set up at each location.

### **Locations**

TrapView:

Placed in field 813-1 at Hald Hovedgaard, GPS: 56.392220, 9.335832.



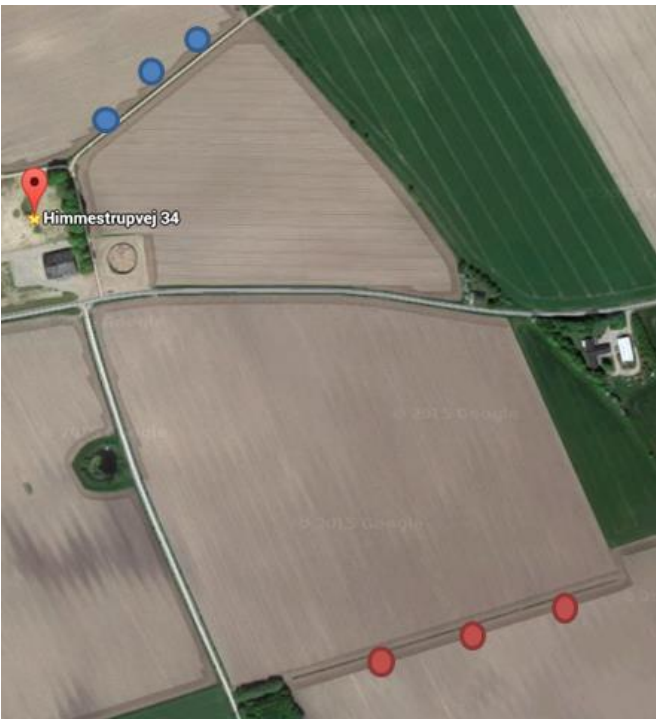
*Green dots are TrapView traps, red are the normal Danish traps*

Placed in field 670-0 in carrots at MD, GPS: 56.304150, 9.327811



*Red dots are TrapView traps from SEGES, blue are the normal Danish traps*

Placed in field 34-0 / 142-0 in red beets / carrots at Himmestrup, GPS: 56.418324, 9.638960



*Red dots are TrapView traps from SEGES, blue are the normal Danish traps*

UK traps:

Placed in field 305-0 in root parsley at Nørbæk, GPS: 56.529813, 9.809250.



*Green dots are normal traps, red dots are the UK traps*

**Results:**

TrapView:

HALD	Total
<b>Danish traps total</b>	<b>183</b>
Trap 1	43
Trap 2	61
Trap 3	74
<b>TrapView traps total</b>	<b>144</b>
Trap 1	54
Trap 2	49
Trap 3	35
Precipitation	199

HIMMESTRUP	Total
<b>Danish traps total</b>	<b>570</b>
Trap 1	191
Trap 2	181
Trap 3	180
<b>TrapView traps total</b>	<b>476</b>
Trap 1	144
Trap 2	152
Trap 3	180
Precipitation	155

MD	Total
<b>Danish traps total</b>	<b>229</b>
Trap 1	68
Trap 2	94
Trap 3	63
<b>TrapView traps total</b>	<b>210</b>
Trap 1	73
Trap 2	61
Trap 3	76
Precipitation	155,5

Total from all TrapView Traps : 830

Total from all normal Traps: 982

UK traps:

NØRBÆK	Total
<b>Normal</b>	<b>519</b>
Trap 1	224
Trap 2	139
Trap 3	152
<b>UK</b>	<b>364</b>
Trap 1	145
Trap 2	118
Trap 3	93
Precipitation	158

**Discussion:**

TrapView:

The results from 2015 shows that TrapView traps did catch almost as many turnip moths as the normal Danish traps (830 in TrapView and 982 in the Danish traps).

But, there still are some challenges...

- It should be easy to use the TrapView because you can follow the amount of turnip moth in the trap from your computer. Anyway in the season you have to change the sticky floorboards every week, because there are many turnip moths in the trap.
- The plastic TrapView "house" is not strong enough them self to stay in a windy place in the middle of a field in the Danish climate. Why an extra house was constructed to make it more strong.



*House constructed to make the trap stronger*

- The trap house becomes over one season very sticky and damaged, why you have to buy new trap houses every year.
- It is difficult to change the sticky floorboards in the trap house, and when you do that and change the pheromone you and the trap house is covered in glue.
- The TrapView traps from SEGES with infra red camera was too heavy and hard to move around in the field. It is important, that the traps are moveable, because they will be placed in a field, were a lot of different mechanical operations are going on, and the field workers have to move the traps at least once a week.
- The infrared camera in the SEGES traps are too heavy, and the plastic construction in the house that holds the camera easily collaps. If the trap tilts in the wind the camera fall out.





*Camera fallen out of the trap, because it is too heavy to the plastic construction inside the trap.*

- The plastic that was intended to be used to put the sticky floorboards into the trap did not work very well, so we have to figure out a new system.



*The plastic which are seen on both sides of the sticky floorboards are difficult to use*

UK traps:

The UK traps did not catch as many turnip moths as the normal Danish traps. This is mostly because of two weeks in the beginning of July (2-jul and 6-jul) where the UK traps did not catch any turnip moths, see the table below, we don't know why.

All other weeks the two types of traps have catch almost the same number of turnip moths.

Nørbæk

Date	13-maj	18-maj	27-maj	03-jun	10-jun	19-jun	26-jun	02-jul	06-jul	10-jul	16-jul	23-jul
Normal	0	0	1	3	13	22	27	51	80	75	101	90
Trap 1					5	11	13	21	35	32	39	37
Trap 2					6	8	6	21	20	19	27	25
Trap 3					2	3	8	9	25	24	35	28
UK	0	0	1	7	15	40	20	0	0	83	95	76
Trap 1					5	12	11			33	39	35
Trap 2					4	16	4			27	30	23
Trap 3					6	12	5			23	26	18
Precipitation	10	5	5	29	0	23	11	10	0	22	0	10

The traps were tested both with UK and Danish pheromone without difference in results.

The UK trap houses are yellow, which do that the bumble bees are getting caught, next year the traps will be colored green.

The glue paper in the UK trap do not catch all the turnip moth, some are just flying around in the trap box. Therefore it is needed to catch the turnip moths in a bucket and kill them, before they can be recognized and counted.

## Conclusion

TrapView:

There is still a lot of work to do before the TrapView traps are useful in carrot production, see the discussion above.

But, if it is important to the warning model of the turnip moth to register the first catch of turnip moths there is very good perspectives in TrapView traps, because then you can follow it from your computer without going in the field. But when the amount of turnip moths are high, the TrapView is not a benefit anymore, because you need to chance the sticky floorboards every week.

As it is now the TrapView traps are not useful in the carrot production.

UK traps:

The UK traps worked very well in 2015. They caught well compared to the Danish traps. UK traps are in some ways easier to handle.



Lars Møller and Pernille Margrethe Bruun Kynde, 10 December 2015